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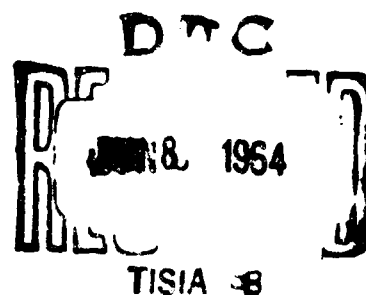*20 - P - ₱0.50*

Development and Standardization of the Air Force Officer Qualifying Test–64

By

Robert E. Miller

Lonnie D. Valentine, Jr.

DTC

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DEVELOPMENT AND STANDARDIZATION OF THE
AIR FORCE OFFICER QUALIFYING TEST -64

By

Robert E. Miller

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FOREWORD

Headquarters USAF places a requirement on the Personnel Research Laboratory for biennial production of new forms of the Air Force Officer Qualifying Test (AFOQT). This report describes the development and standardization of AFOQT-64, the form which was implemented 1 September 1963.

Previous forms of the AFOQT were designated by letters A through G. Beginning with AFOQT 64, forms are identified by the last two digits of the fiscal year of implementation. The same identification system is used for the airman selection and classification tests.

Materials developed for AFOQT-64 consist of 5 test booklets, administration and scoring manuals, a set of 11 scoring keys. 2 special answer sheets, and a revision of the interpretative manual appropriate to this form of the test.

ABSTRACT

A revised form of the Air Force Officer Qualifying Test, AFOQT-64, replaced AFOQT Form G in September 1963. The new form is more easily administered and scored than earlier forms. It contains 542 items organized into 13 subtests. Scores are obtained for the usual AFOQT composites: Pilot, Navigator-Technical, Officer Quality, Verbal, and Quantitative. In addition, the test can be scored for 2 special composites (Academic and Career Potential) constructed for use only in the AFROTC Officer Education Program. Item statistics, reliability estimates, and distribution statistics for the composite scores are reported. The composites were scaled with reference to equivalent Project TALENT composites. Instead of the USAF Academy candidate population, previously used in scaling AFOQT scores, the normative base was the nationwide 12th grade male population.

Keywords: selection tests, officer selection, test construction, test standardization, Air Force Officer Qualifying Test—64, Project TALENT

This report has been reviewed and is approved.

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Commander

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Technical Director

Hq 6570th Personnel Research Laboratory

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1. INTRODUCTION

Since 1953 the United States Air Force has relied on the Air Force Officer Qualifying Test (AFOQT) and related tests as the primary instruments for the selection and classification of officer personnel. The history of these instruments and their antecedents has been reported elsewhere (Valentine & Creager, 1961). Currently, the AFOQT is the only instrument used throughout the Air Force in officer selection and classification programs. A new form of the test is produced biennially.

The most recent form of the test is AFOQT-64. This report describes the development of this form and the manner in which normative data were provided for it.

2. DESCRIPTION OF AFOQT-64

General Characteristics

AFOQT-64 is essentially identical with earlier forms of the AFOQT in terms of psychological functions measured. It differs from earlier forms, however, in the following respects:

a. AFOQT-64 is shorter than previous forms. It contains a total of 542 items and requires slightly under six hours for complete administration. Some reduction in the number of items was made in every subtest. Earlier forms contained from 645 to 855 items and required up to approximately eight hours to administer.

b. AFOQT-64 yields no interest composite scores. The interest composites of earlier forms were used only in counseling situations as adjuncts to the aptitude composites, and they have not proved highly indicative of success in any program.[1] No qualifying scores were ever established for them.

c. AFOQT-64 requires simpler scoring techniques than earlier forms. The simplified scoring is partly a result of elimination of the interest composites. In addition, scoring the aptitude composites requires fewer keys and part scores than in earlier forms. It is assumed that the simplified scoring system will reduce the number of scoring errors.

d. AFOQT-64 is contained in five booklets, rather than the three which characterize most earlier forms. The greater number of booklets provides greater flexibility of test administration. There is a booklet for each set of subtests belonging to only one composite, and a booklet for each set common to two composites. As the test is normally administered, it is never necessary to begin the session in the middle of a booklet.

e. An entirely new normative base was used for AFOQT-64. Other recent forms of AFOQT were standardized on candidates for appointment to the Air Force Academy. AFOQT-64 was standardized with reference to the so-called Project TALENT sample. Details of the procedure are described in Section 5, below. It is anticipated that this normative base and procedure will be used for future forms of the AFOQT, as well as other Air Force tests.

f. AFOQT-64 contains fewer subtests than earlier forms. There are 13 subtests in AFOQT-64 as compared with 19 in Form G. This reduction was accomplished by combining various short subtests of the Quantitative aptitude composite in a spiral omnibus arrangement, and by similarly combining subtests of the Verbal composite. All item types in the formerly separate subtests are still represented in AFOQT-64.

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[1] AFPRT 411. Manual for Interpretation of aptitude and interest scores of the AFOQT, 1 Dec 58. See also Miller (1960).

Subtests

An outline of the content of AFOQT-64 is presented in Table 1. Following is a brief description of each subtest.

Quantitative Aptitude consists of items involving general mathematics arithmetic reasoning, and interpretation of data read from tables and graphs.

Verbal Aptitude consists of items involving vocabulary, verbal analogies, reading comprehension, and understanding of the background of current events.

Officer Biographical Inventory consists of items pertaining to past experiences, preferences, and certain personality characteristics related to measures of officer effectiveness.

Scale Reading consists of items in which readings are to be taken of various scales and gauges. Many of the items require very fine discriminations.

Aerial Landmarks consists of pairs of photographs of terrain as seen from different positions of an aircraft in flight. Landmarks indicated on one of the photographs are to be identified on the other.

General Science consists of achievement items related to the basic principles of the physical sciences, with emphasis on physics.

Mechanical Information consists of verbal items related to understanding of basic mechanics and knowledge of the functions of various mechanical devices.

Mechanical Principles consists of diagrams of complex apparatus and requires understanding of the consequences of prescribed operations of the apparatus.

Pilot Biographical Inventory consists of self-report items relating to background experiences and interests known to be related to success in pilot training.

Aviation Information consists of semi-technical items pertaining to various types of aircraft, components of aircraft, and operation of aircraft.

Visualization of Maneuvers consists of items requiring identification of the attitude of an aircraft in flight after executing a verbally described maneuver

Instrument Comprehension consists of items similar to those in Visualization of Maneuvers, except that the maneuvers are indicated by readings of a compass and artificial horizon

Flight Orientation consists of pairs of photographs of terrain as seen from an aircraft executing a maneuver. The maneuver is to be identified. In some of the items two maneuvers are occurring and both must be identified.

Table 1. Content of AFOQT-64[a]

SUBTESTS	NO. OF ITEMS	COMPOSITES						
		PILOT	NAV-TECH	OFFICER QUALITY	VER-BAL	QUANTI-TATIVE	ACADEMIC	CAREER POTENTIAL
Booklet 1 (PRT 922)								
Quantitative Aptitude	60		X	X		X	X	
Booklet 2 (PRT 923)								
Verbal Aptitude	60			X	X		X	
[b]Officer Biographical Inventory	100			X				X
Booklet 3 (PRT 924)								
[c]Scale Reading	48		X					
[c]Aerial Landmarks	40		X					
General Science	24		X					
Booklet 4 (PRT 925)								
Mechanical Information	24	X	X					
Mechanical Principles	24	X	X					
Booklet 5 (PRT 926)								
Pilot Biographical Inventory	50	X						
Aviation Information	24	X						
[c]Visualization of Maneuvers	24	X						
[c]Instrument Comprehension	24	X						
[c]Flight Orientation	40	X						
Total	542							

[a]Scoring is rights only except for speeded subtests. Scale Reading, Aerial Landmarks, and Flight Orientation are scored R-W/4; Visualization of Maneuvers and Instrument Comprehension are scored R-W/3. Associated answer sheets are PRT 87, 927, and 928. Associated manuals are PRT 920 and 921.

[b]Not administered to female applicants.

[c]Speeded Subtests.

Composite Scores

Table 1 shows the subtests which serve as components of each of the five operational aptitude composites: Pilot, Navigator-Technical, Officer Quality, Verbal, and Quantitative. As with other forms of the AFOQT, the composite scores are obtained without application of differential weights to the subtests in the scoring process. In operational use, the subtests are not scored separately.

In addition to the operational composites, AFOQT-64 yields two special composites. These were designed to meet the needs of the AFROTC Officer Education Program (OEP) and are for the use of OEP only.[2] The new composites are derived from Officer Quality subtests and are known as the Academic and Career Potential composites. The Academic composite consists of the Quantitative and Verbal aptitude subtests. The Career Potential composite consists only of the Officer Biographical Inventory. These special composites are also shown in Table 1.

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[2] These composites are not discussed in the AFOQT-64 scoring manual. Special directions for obtaining and interpreting them were furnished to the OEP Planning Group.

3. ITEM SELECTION

Test items for AFOQT-64 were selected from available item pools appropriate for officer tests. A few anchor items which had appeared in AFOQT Form G were included, but in general the selected items had not been used in any recent operational test. An attempt was made to attain approximately the same difficulty level and internal consistency within subtests as in previous forms of the AFOQT. Data on the item difficulties and correlations with the appropriate subtest scores are presented in Table 2. The correlations are phi coefficients based on the upper and lower 27% of samples of about 400 examinees who were administered experimental forms of AFOQT subtests. The difficulty index is the proportion of the sample marking the correct response. Examinees were student officers or basic airmen in Categories I and II of the Armed Forces Qualification Test (AFQT).

Table 2. Item Difficulty Levels and Internal Consistency

SUBTEST	NO. OF ITEMS	DIFFICULTY LEVEL		INTERNAL CONSISTENCY	
		RANGE	MEDIAN	RANGE	MEDIAN
Quantitative Aptitude	60	.24–.87	.49	.31–.87	.56
Verbal Aptitude	60	.23–.87	.56	.33–.86	.52
Scale Reading	48	.20–.81	.56	.17–.77	.42
Aerial Landmarks	40	.25–.80	.64	.42–.81	.55
General Science	24	.28–.78	.53	.42–.73	.54
Mechanical Information	24	.20–.85	.47	.33–.71	.52
Mechanical Principles	24	.26–.74	.51	.37–.67	.54
Aviation Information	24	.28–.84	.52	.31–.85	.54
Visualization of Maneuvers	24	.24–.81	.66	.31–.60	.45
Instrument Comprehension	24	.24–.78	.61	.28–.77	.50
Flight Orientation	40	.49–.86	.74	.49–.79	.64

Table 2 shows that subtests of AFOQT-64 are fairly consistent internally and that difficulty levels of items are generally spread over a sufficiently wide range around the desired median of .50. A possible exception is the set of items comprising Flight Orientation, but a relatively narrow range of difficulty characterizes this type of item. Item statistics were not obtained for the two biographical subtests. It is assumed from the nature of their content that their internal consistency is low.

4. RELIABILITY

An effort was made to assess the reliabilities of both the subtests and composites of AFOQT-64. As is to be expected, the reliabilities are slightly lower than for earlier AFOQT forms because of the shortening of the test. Reliabilities for the shortened subtests were estimated by the Spearman-Brown formula from reliabilities which had been computed for AFOQT

Form G. The Form G subtest reliabilities were based on retest results for the speeded subtests and on Kuder-Richardson Formula 20 for other subtests. The application of the Spearman-Brown formula to Kuder-Richardson reliabilities was made on the basis that the Kuder-Richardson results are equivalent to a generalized split half reliability coefficient when the assumption of homogeneity of item content is reasonably met. Composite reliabilities were computed from subtest reliabilities by the formula for the reliability of a composite.[3]

<p align="center"><i>Table 3</i>. Reliability Estimates for AFOQT-64</p>

SUBTEST OR COMPOSITE	RELIA-BILITY	SUBTEST OR COMPOSITE	RELIA-BILITY
Quantitative Aptitude	.90	Instrument Comprehension	.65
Verbal Aptitude	.85	Flight Orientation	.82
Scale Reading	.85	Pilot Composite (without Pilot Biographical Inventory)	.91
Aerial Landmarks	.68		
General Science	.82	Navigator-Technical Composite	.94
Mechanical Information	.80	Officer Quality Composite (without Officer Biographical Inventory)	.91
Mechanical Principles	.79		
Aviation Information	.85	Verbal Composite	.85
Visualization of Maneuvers	.77	Quantitative Composite	.90

Reliability data for AFOQT-64 are shown in Table 3. Reliabilities of the biographical subtests were not computed and have not been computed for any recent form of the AFOQT because of the heterogeneous content of the biographical area. The reliability of Flight Orientation is based on an alternate subtest in Form G known as Stick and Rudder Orientation. It appears best to regard the results in Table 3 as only approximations. These results nevertheless constitute evidence that AFOQT-64 subtests and composites attain acceptable levels of stability and consistency.

<p align="center">5. STANDARDIZATION</p>

General Procedure

Beginning in 1955, the normative base of the AFOQT was the current Air Force Academy candidate group. Each group contained approximately 5,000 candidates and was, on the whole, satisfactory for normative purposes. However, certain difficulties arose. Because of increasingly rigorous self-selection among the candidates, particularly in the quantitative aptitude domain, it became necessary to adjust the norms to avoid disqualifying excessively large numbers of applicants for other officer programs. The rationale of the adjustment process has been described elsewhere (Valentine & Creager, 1961). Recent evidence suggested that the process was yielding an overcorrection. Moreover, after 1960 the Academy did not require the AFOQT as a selection test because its contribution was largely redundant in the presence of the College Entrance Examination Board (CEEB) tests which were part of the selection battery. The CEEB tests offered the advantage of permitting direct comparison of Academy groups with other college level groups.

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[3] The formula is:

$$r_{tt} = \frac{r_{aa}\sigma_a^2 + r_{bb}\sigma_b^2 + \cdots + r_{nn}\sigma_n^2 + 2(r_{ab}\sigma_a\sigma_b + \cdots + r_{mn}\sigma_m\sigma_n)}{\sigma_a^2 + \sigma_b^2 + \cdots + \sigma_n^2 + 2(r_{ab}\sigma_a\sigma_b + \cdots + r_{mn}\sigma_m\sigma_n)}$$

where $a, b, \ldots, n$ are internally homogeneous subtests entering into the composite with unit weight (Wherry & Gaylord, 1943, p. 250).

A new normative base was obtained by relating the AFOQT to the Project TALENT test battery. This battery was used in a comprehensive survey of approximately 400,000 students in a stratified sample of secondary schools. The survey has been described elsewhere (Flanagan et al., 1960). By relating the AFOQT to the Project TALENT battery, it became possible to secure a large sample of the 12th grade male population of the United States as the AFOQT normative base.

The details of the study which originally related the AFOQT (and other Air Force tests) to Project TALENT have been reported elsewhere (Dailey, Shaycoft, & Orr, 1962). Briefly, the Project TALENT battery and AFOQT Form G were administered, in that order, to approximately 2,500 basic airmen, stratified by AFQT deciles in the percentile range from 21 to 100. By multiple linear regression methods, the TALENT tests which yielded the optimal prediction of each AFOQT composite were identified. In this way "TALENT composites" were defined corresponding to each AFOQT aptitude composite. The composition of these TALENT composites, and the integral weights applied to each component in predicting the corresponding AFOQT composites, are shown in the Appendix, Table 7. The weights are roughly proportional to the average of the raw score regression weights obtained separately for two random subsamples of basic airmen. The correlations between corresponding TALENT and AFOQT composites in the two subsamples are shown in Table 4. These data are from a stage of the regression analysis prior to the determination of the integral weights and the final composition of the TALENT composites.

Table 4. Correlation Between Corresponding TALENT and AFOQT Composites [a]

COMPOSITE	CORRELATION	
	SUBSAMPLE A (N = 1247)	SUBSAMPLE B (N = 1242)
Pilot	.80	.80
Navigator-Technical	.89	.87
Officer Quality	.86	.86
Verbal	.85	.81
Quantitative	.84	.80

[a] Data assembled from Dailey et al. (1962, Table 3).

An additional product of the study relating the AFOQT to Project TALENT was a set of tables which establish equipercentile conversions between TALENT composites and corresponding AFOQT Form G composites in raw score form. These tables also show percentile equivalents of the TALENT composite scores, based on a 4-percent subsample of 12th grade males from the Project TALENT sample of 400,000 cases. From these tables and the AFOQT Form G norm tables, it was possible to establish the TALENT composite raw scores corresponding to Form G percentiles. This was done for each composite separately. The results are reported in the Appendix, Table 8.

Having the data in Table 8, norming of AFOQT-64 was accomplished by the following general operations:

a. Administer each AFOQT-64 composite to approximately 1,000 examinees, along with Project TALENT tests needed to compute the corresponding TALENT composite. Use the same order of test administration and type of examinee (basic airmen stratified by AFQT deciles) as in the study which defined the TALENT composites.

b. Score each TALENT test and AFOQT-64 composite in the normal manner. Compute the TALENT composite scores from the TALENT tests by using the integral weights shown in Table 7.

c. Locate Air Force percentile equivalents in the TALENT composite score distributions by using the appropriate column of Table 8.

d. Establish equipercentile conversions between the TALENT composite distributions and the corresponding AFOQT-64 composite distributions.

When appropriately smoothed, the resulting score distributions and their percentile equivalents constituted the AFOQT-64 norm tables, except for certain modifications discussed below. Constructed in this general way, these scales provide equivalence of meaning for corresponding percentile scores on AFOQT-64 and AFOQT Form G. In addition, these scales relate AFOQT-64 scores to a large, stable sample of 12th grade males and permit future AFOQT forms to be similarly related to the same sample. Thus a built-in check is provided against the possibility of distorted distributions resulting from undetected shifts in the aptitudes of successive standardizing groups.

Because of the excessive amount of testing time per examinee, it was not feasible in practice to standardize all AFOQT-64 composites on a single sample of 1,000 cases. It was necessary to use three samples of approximately 1,000 cases each for different composites. There is evidence, however, that the samples are sufficiently similar to permit comparison of an examinee's scores on different composites in order to assess his aptitude strengths and weaknesses. The evidence comes partly from the stratification of each sample by AFQT deciles. Further evidence comes from a study of the possibility that the samples may nevertheless differ significantly in terms of specific aptitudes. This study was undertaken in terms of the aptitude indexes of the Airman Qualifying Examination (AQE). A complete set of four aptitude indexes (Mechanical, Administrative, General, Electronics) were available for nearly every examinee in the three samples.

Table 5. Means and Standard Deviations of
AQE Aptitude Indexes in AFOQT-64 Subsamples

(For each subsample, N = 104)

APTITUDE INDEX	SUBSAMPLE 1		SUBSAMPLE 2		SUBSAMPLE 3	
	MEAN	SD	MEAN	SD	MEAN	SD
Mechanical	56.30	22.90	52.12	25.79	52.70	24.37
Administrative	63.08	18.58	64.81	18.15	63.56	18.20
General	59.09	19.94	56.73	21.49	57.31	18.82
Electronics	52.79	25.10	49.29	26.03	53.99	22.98

A 10-percent subsample was drawn from each sample in such a way as to preserve the stratification by AFQT deciles. Each aptitude index was then distributed for each subsample. The results, in terms of the distribution statistics, are shown in Table 5. All possible pairs of distributions of each aptitude index in the three subsamples were then compared in their entirety by application of the chi-square test. None of the differences were statistically significant at the .01 level, and only one difference among the 12 comparisons was significant at the .05 level. Hence the subsamples may reasonably be considered homogeneous with respect to the four aptitude indexes.

Special Problems

In practice, various considerations made it necessary to depart somewhat from the above general norming design for all except the Pilot composite. The special difficulty with the Navigator-Technical and Quantitative composites was the overcorrection for self-selection in the Air Force Academy candidate groups. This distortion is reflected in the columns for these composites in Table 8. To prevent it from affecting AFOQT-64, the norms for these composites in AFOQT Form G were recomputed in a straightforward manner without the correction. The recomputed norms yielded

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roughly rectangular score distributions in the Academy candidate group, indicating that the distortion was essentially removed. The columns for the Navigator-Technical and Quantitative composities in Table 8 were then revised on the basis of the recomputed norms, and the revision was used in norming AFOQT-64. This revision of Table 8 is shown in the appropriate columns of Table 9, Appendix.

In the case of the Officer Quality composite, the norming was accomplished indirectly through the special Academic composite. The procedure involved estimating the mean and standard deviation of the TALENT Academic composite, defined as the TALENT Officer Quality composite minus the Mature Personality subtest, and matching score points in the TALENT Academic and Officer Quality distributions in terms of deviation units from their respective means. The result is shown in the last column of Table 9. It was estimated that this TALENT Academic composite correlates .86 with the AFOQT Academic composite, defined as the Officer Quality composite minus the Officer Biographical Inventory. The Officer Biographical Inventory was not considered equivalent to Mature Personality in terms of the psychological functions measured.

In administering AFOQT-64 for standardizing purposes, the Officer Biographical Inventory was omitted. Likewise, Mature Personality was omitted from the TALENT tests. The Academic composite column in Table 9 was thus immediately usable for norming both the AFOQT-64 Academic composite and the female Officer Quality composite according to the general standardizing procedure. To norm the male Officer Quality composite of AFOQT-64, a constant representing the mean of the Officer Biographical Inventory was added to the distribution of the AFOQT-64 Academic composite. This constant, with a value of 36.0, is the approximate mean Officer Biographical Inventory score in a sample of 2,000 candidates for Advanced AFROTC training who had taken an inventory with the same content as that of AFOQT-64. The addition of this mean as a constant assumes a zero correlation between the Officer Biographical Inventory and the Academic composite. It is known that this assumption is approximately, but not fully, satisfied. The Officer Biographical Inventory distribution in the AFROTC sample was then used in a straightforward manner to scale the Career Potential composite without reference to Project TALENT.

A final departure from the general standardizing procedure arose in norming the Verbal and Quantitative composites. The design of AFOQT-64 called originally for exclusion of these composites, since neither are used in qualifying for any program. These composites were reinstated only after administration of AFOQT-64 for scaling had been completed. To avoid additional test administration, it was decided to substitute comparable distributions of Verbal and Quantitative scores for the distributions which would have been obtained from the standardizing samples. Such comparable distributions were found in the samples on which the TALENT composites were originally developed. Since AFOQT Form G was administered to these samples, it was only necessary to perform equipercentile conversions through the appropriate TALENT composites to arrive at estimates of the AFOQT-64 Verbal and Quantitative composite distributions in the normative samples.

Whether such substitutions will lead to improper norms or not depends on the comparability of the distributions. This cannot be assessed directly for the Verbal and Quantitative composites, but it can be assessed for all other operational composites. This was done by comparing cumulative percentage distributions for corresponding composites in the samples which yielded the TALENT composites and in the AFOQT-64 norming samples. These distributions are shown in Table 10, Appendix. Marked similarities for corresponding composites are apparent in the table, especially for the Officer Quality composite. Mature Personality is included in the original TALENT Officer Quality distribution, and this should slightly attenuate the very close similarity observed. Mature Personality, however, increases the multiple correlation between the TALENT Officer Quality composite and the corresponding AFOQT composite by only .02.

Table 10 indicates that a somewhat higher level of aptitude exists in the Pilot composite than in other composites for any given percentile. Data are not yet available to determine whether this difference exists outside of basic airman samples. It is reasonable, however, to attribute the difference to the samples. The basic airman educational level is lower than in groups for which the AFOQT was intended, and performance on achievement items is consequently depressed. Such items are numerous in the Navigator-Technical and Officer Quality composites but infrequent in the Pilot composite. The AFOQT-64 norms do not take this effect into account because the percentiles are established with reference to AFOQT Form G and its Air Force Academy norm group. The difference in Table 10 is not found in Form G score distributions, whether based on original or revised norms. Other differences are found, however, as a result of the overcorrection for self-selection among Academy applicants.

6. DISTRIBUTION STATISTICS AND INTERCORRELATIONS

Table 10 shows markedly different score distributions than would be expected in an officer or student-officer population, where approximately 5 percent of the population should appear in each interval of the Air Force percentile scale. This circumstance does not create difficulties in using the test, since the norms are not established directly on the normative groups. Raw score means and standard deviations for the AFOQT composites in the normative groups, however, will depart from the corresponding values in officer or student-officer populations. The computed means and standard deviations in the norm groups are shown in Table 6. Also shown in this table are the estimated means and standard deviations in an officer or student-officer population, and in the 12th grade male population. The estimates were made from the AFOQT-64 norm tables and unpublished 12th grade male norm tables.[4]

Table 6. Raw Score Means and Standard Deviations
of AFOQT-64 Composites for Three Groups

COMPOSITE	NORMATIVE SAMPLES[a]		OFFICER POPULATION[b]		12TH GRADE MALE SAMPLE[c]	
	M	SD	M	SD	M	SD
Pilot	58.4	25.8	95.5	21.4	61.4	25.7
Navigator-Technical	49.7	22.7	99.5	21.8	59.5	20.6
Officer Quality	61.4	19.1	106.5	15.1	79.7	17.1
Verbal	22.2	10.1	37.5	6.7	25.3	10.7
Quantitative	12.5	8.4	37.5	10.1	16.7	10.3
Academic	34.6	19.1	70.5	15.1	43.7	17.1
Career Potential	26.8	7.2	37.5	5.4	- -	- -

[a] Ns vary from 1049 to 2000.

[b] Data estimated from AFOQT-64 norm tables.

[c] Data estimated from unpublished tables by Dailey et al., based on 4% subsample of 12th grade males in the Project TALENT sample. No data available on Career Potential composite for this sample.

With earlier forms of AFOQT it was feasible to determine composite and subtest intercorrelations from the normative sample. For AFOQT-64 this was precluded because of the necessity of using three separate normative samples. As operational data accumulate, however, complete matrices of composite and subtest intercorrelations will be computed. These are not expected to depart greatly from those of earlier forms of the AFOQT. A complete table of intercorrelations for an earlier form has been reported elsewhere (Christal & Krumboltz, 1957).

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[4] Unpublished Technical Appendix C to Dailey, Shaycoft, & Orr (1962); available from Personnel Research Laboratory (PRS) to qualified requesters for official use.

7. SUMMARY

The development and standardization of AFOQT-64 have been described. In content, this test is essentially similar to older forms, but it has been simplified in terms of the mechanics of administering and scoring. It contains the five aptitude composites which are common to all forms of the AFOQT and two special aptitude composites authorized for use in the Officer Education Program only. This test was standardized with reference to Project TALENT by means of a new procedure in which the ultimate reference group is the 12th-grade male population of the United States.

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APPENDIX

SUPPLEMENTARY TABULATIONS

Table 7. Composition of the TALENT Composites[a]

COMPOSITE	TALENT COMPONENTS	WEIGHT
Pilot	R-110 Aeronautics and Space (Info)	3
	R-111 Electricity and Electronics (Info)	1
	R-112 Mechanics (Info)	3
	R-270 Mechanical Reasoning	3
	R-281 Visualization in Two Dimensions	1
	R-282 Visualization in Three Dimensions	2
	R-333 Mathematics III: Advanced	2
Navigator-Technical	R-106 Mathematics (Info)	3
	R-111 Electricity and Electronics (Info)	2
	R-270 Mechanical Reasoning	3
	R-282 Visualization in Three Dimensions	3
	R-312 Mathematics II: Introductory	3
Officer Quality	R-106 Mathematics (Info)	3
	R-110 Aeronautics and Space (Info)	2
	R-250 Reading Comprehension	1
	R-312 Mathematics II: Introductory	3
	R-333 Mathematics III: Advanced	5
	R-610 Mature Personality	2
Verbal	R-102 Vocabulary (Info)	2
	R-103 Literature (Info)	2
	R-106 Mathematics (Info)	2
	R-110 Aeronautics and Space (Info)	3
	R-250 Reading Comprehension	1
Quantitative	R-106 Mathematics (Info)	2
	R-312 Mathematics II: Introductory	2
	R-333 Mathematics III: Advanced	3

[a] Data assembled from Dailey et al. (1962, Table 9).

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Table 8. TALENT Composite Raw Scores Corresponding to AFOQT Percentiles

AFOQT PERCENTILE	TALENT COMPOSITES				
	PILOT	NAVIGATOR-TECHNICAL	OFFICER QUALITY	VERBAL	QUANTITATIVE
95	224 and above	259 and above	299 and above	20? and above	121 and above
90	218 – 223	249 – 258	284 – 298	195 – 204	117 – 120
85	214 – 217	242 – 248	278 – 283	189 – 194	113 – 116
80	210 – 213	236 – 241	269 – 277	186 – 188	107 – 112
75	207 – 209	225 – 235	266 – 268	179 – 185	102 – 106
70	205 – 206	218 – 224	259 – 265	177 – 178	98 – 101
65	201 – 204	214 – 217	256 – 258	176	94 – 97
60	197 – 200	206 – 213	249 – 255	172 – 175	89 – 93
55	193 – 196	200 – 205	245 – 248	170 – 171	87 – 88
50	190 – 192	195 – 199	240 – 244	168 – 169	84 – 86
45	186 – 189	190 – 194	236 – 239	164 – 167	81 – 83
40	182 – 185	185 – 189	229 – 235	159 – 163	77 – 80
35	177 – 181	178 – 184	226 – 228	157 – 158	74 – 76
30	173 – 176	172 – 177	215 – 225	153 – 156	70 – 73
25	170 – 172	162 – 171	208 – 214	149 – 152	64 – 69
20	165 – 169	155 – 161	198 – 207	143 – 148	54 – 63
15	157 – 164	146 – 154	184 – 197	138 – 142	49 – 53
10	150 – 156	133 – 145	166 – 183	126 – 37	43 – 48
05	136 – 149	116 – 132	141 – 165	112 – 125	34 – 42
01	135 and below	115 and below	140 and below	111 and below	33 and below

Table 9. TALENT Composite Raw Scores Corresponding to Revised AFOQT Percentiles

AFOQT PERCENTILE	TALENT COMPOSITES		
	NAVIGATOR-TECHNICAL	QUANTITATIVE	ACADEMIC
95	270 and above	129 and above	265 and above
90	268 – 269	125 – 128	251 – 264
85	265 – 267	124	245 – 250
80	257 – 264	121 – 123	237 – 244
75	253 – 256	118 – 120	233 – 236
70	250 – 252	117	228 – 232
65	248 – 249	116	224 – 227
60	244 – 247	115	218 – 223
55	240 – 243	110 – 114	214 – 217
50	237 – 239	109	210 – 213
45	232 – 236	106 – 108	206 – 209
40	225 – 231	102 – 105	199 – 205
35	218 – 224	98 – 101	197 – 198
30	214 – 217	94 – 97	186 – 196
25	207 – 213	89 – 93	180 – 185
20	197 – 206	86 – 88	170 – 179
15	189 – 196	81 – 85	157 – 169
10	176 – 188	74 – 80	140 – 156
05	156 – 175	58 – 73	117 – 139
01	155 and below	57 and below	116 and below

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Table 10. Cumulative Percentage Distributions for TALENT Composites in Original Air Force TALENT Sample and AFOQT-64 Norming Samples

(AF TALENT sample, 1247; Pilot norming sample, 1049; Navigator norming sample, 1069; Officer Quality norming sample, 1053)

AFOQT PER- CENTILE	TALENT COMPOSITES					
	PILOT		NAVIGATOR-TECHNICAL		OFFICER QUALITY	
	AF TALENT	NORMING	AF TALENT	NORMING	AF TALENT	NORMING
95	0.7	0.2	0.6	0.4	0.2	0.0
90	1.4	0.6	0.9	0.5	0.4	0.3
85	2.4	1.0	1.1	0.8	0.8	0.6
80	3.4	1.4	1.6	1.0	1.1	0.9
75	3.9	1.8	2.3	1.4	1.4	1.1
70	4.8	2.4	2.6	1.5	2.1	1.6
65	6.3	3.9	3.0	1.7	2.7	1.8
60	8.3	6.1	3.4	2.2	3.2	3.2
55	10.0	7.9	4.7	2.6	3.9	3.6
50	11.9	9.7	5.5	3.2	4.6	4.2
45	13.6	11.8	6.7	4.4	5.2	5.3
40	15.7	13.6	7.8	5.9	6.3	6.6
35	18.6	16.0	9.4	8.1	7.1	6.9
30	23.2	19.7	10.6	9.6	9.2	9.5
25	25.7	21.1	12.7	11.1	11.3	11.1
20	30.1	24.5	15.7	14.0	14.0	13.6
15	37.1	30.2	19.0	17.3	17.8	18.1
10	43.5	36.5	23.9	21.3	24.8	24.2
05	57.3	51.3	35.4	31.9	36.6	38.2
01	100.0	100.0	100.0	100.0	100.0	100.0

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